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ABSTRACT

The underrepresentation or absence of blacks in many science and engineering areas is of major concern. A strong mathematics background is essential to success in these fields, and mathematics anxiety is the greatest obstacle facing many black students. Seven common causes of mathematics anxiety among blacks are listed: low expectations and callous reactions of teachers to student questions; teachers' overemphasis on fundamental and computational procedures rather than creative problem solving; parental expressions of their mathematics difficulties; inadequate knowledge of black achievement in science and engineering; the belief that special talents are needed; the belief that mathematical ability is inherent rather than developed; and the failure to be properly trained in early grades. The fear that prevents many blacks from seeking jobs that require mathematics is also discussed. Five challenges that must be faced are then presented to aid blacks in overcoming mathematics anxiety. (MNS)

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MATH ANXIETY:
CAUSE, IMPACT AND CHALLENGE TO BLACK STUDENTS

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MATH ANXIETY
CAUSE, IMPACT AND CHALLENGE TO BLACK STUDENTS

Math anxiety, the silent foe of many often criticized educational systems in our country, has more harshly affected Blacks than any other segment of our present society. For well over a decade, the underrepresentation or the absence of representation of Blacks in many science and engineering areas has been a major concern. With current opportunities in science and engineering and the prospect of even greater opportunities in the future, this shortage of Blacks in science and engineering becomes even more acute.

A report by the Bureau of Labor Statistics forecasts that occupations in science and engineering will grow by 40 percent between 1979 and 1990. This growth will create 100,000 new jobs in the mathematical, physical, life and social science; plus 250,000 new engineering jobs and 480,000 jobs in the computer professions. With the loss of so many potential jobs in other sectors, the ability of Blacks to qualify for more jobs in science and engineering may well be the key to the economic future of Blacks.

A strong mathematics background is essential to success in any of the fields of science and engineering. To this end, much energy has been expanded in arriving at the conclusion that math anxiety is the greatest obstacle facing many Black students. To overcome this anxiety, we as teachers, parents, community leaders, and educators will have to identify its cause and impact, and be prepared to face the challenges necessary to

prevent and eliminate it. This article will address a few of the causes and impacts of math anxiety on Black students and list some of the challenges that must be faced to overcome math anxiety.

There are many causes of math anxiety. Contrary to general belief, it is not inherent, it is a developed phenomenal that once allowed to develop is extremely difficult to eliminate.

Listed below are several causes of math anxiety that are common today among Blacks:

1. Low expectation and callous reactions by teachers to students questions and responses.
2. Over emphasis on fundamental and computational procedures by teachers instead of guiding students through creative problem solving.
3. Parental expressions of their difficulties with mathematics.
4. Inadequate knowledge of the achievements of Blacks historically in science and engineering.
5. The belief that special talents are required.
6. The belief that mathematical ability is inherent instead of developed.
7. Failure to be properly trained in early grades due to inept teaching methods and lack of commitments.

Math Anxiety often results in fear that prevents many Blacks from seeking jobs that may require computations. It also prevents progress of qualified people when high level assignments require greater understanding of mathematics. Additional results of math anxiety has had a limiting impact on the number of skilled craftmen, union apprentice, and various other technical and semi-skilled jobs. Finally, math anxiety causes more students to avoid or bypass many lucrative fields of study because of the assumed mathematics requirements.

The future belongs to the individual who has the capacity to succeed in high demand areas where few others succeed. Today, science and engineering holds the key to the future and mathematics is the key to successfully master these areas. The jobs are there now and will continue to be there in the future. If Blacks are to take their rightful place, they must know the importance of mathematics as a tool for success in itself and recognize it as a necessary skill for success in other fields. They must know that our society is dependent on mathematical and quantitative expertise. Minorities can move into the forefront in these areas by the challenge of eliminating all of the vestiges of math anxiety.

To do this Blacks must:

1. Understand how seriously the educational system has shortchanged them in the basic 3 R's by concentrating more on reading and writing than arithmetic. Blacks must be prepared to take concrete steps to fill this inexcusable mathematical gap and move forward to overcome this mathematical gap.

2. Participate more fully in all areas of mathematics and science in high school and college and be prepared to pursue whatever direction that seems best.

3. Realize that inadequate teaching methods may contribute to math anxiety. Instead of depending solely on lectures, teacher demonstrations, textbook memorization and whole class activities; the teacher should assist the student in his effort to acquire a proper understanding of mathematical concepts by giving intuitive meaning.

4. Blacks must establish a dialogue of mathematics and related subjects with children at an early age and continue throughout the school years since this will increase the interest and decrease the fear.

5. Blacks must involve the community and the church in group process of conducting workshops and seminars that will assist in the unlearning of math anxiety.

"Mathematical Anxiety" is not just a clever slogan; it is a reality, affecting millions of people, handicapping them in their daily lives and reducing their job opportunities. Once math anxiety is understood, doing

math is not far behind. We can't turn the clock back. There will be more numbers in our lives, not fewer. If Latin was the necessary language of an earlier time, mathematics is the sine qua non of ours.

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